

**REMARKS****I. Status of the Claims:**

Claims 1-9 and 11-14 are currently pending. The Applicant wishes to thank the Examiner for the indication of allowability of claim 13.

By this Amendment, claim 13 has been amended to address a typographical error. Upon entry of this Amendment, claims 1-9 and 11-14 would be pending. No new matter is introduced by this Amendment and thus entry and consideration of this Amendment are respectfully requested.

**II. Objection of the Claims:**

Claim 13 is objected to due to a minor typographical error. The Applicant has amended claim 13 to address the Examiner's concerns. Reconsideration and withdrawal of the objection are respectfully requested.

**III. Claim Rejections under 35 U.S.C. §§ 102 and 103:**

Claims 1-7, 9, 11-12 and 14 are rejected under 35 U.S.C. § 102(b) as being anticipated by Byren (US 6,014,391). Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Byren in view of Carrig (US 6,658,036). The Applicant respectfully traverses the rejection of these claims.

Claims 1 and 12 are directed to arrangements having characteristics of the path through the material of the optical radiation that is to be amplified. Claim 1, for example, specifies that the device defines "a path through the gain region for *optical radiation to be amplified*", and method Claim 12 which covers "a method of amplifying optical radiation" describes "guiding *said optical radiation* along a path . . . ."

In Byren, on the other hand, there is no disclosure whatsoever of the path through the device which is taken by the *optical radiation* that is to be amplified. For example, Byren (e.g., in its abstract) discloses a “method and apparatus for improving the thermal performance of a slab laser”. Byren primarily details methods to control heat flow and indicates in its figures the path of the pump radiation. Byren does not however disclose or suggest any information about the path of the optical radiation to be amplified and certainly nothing in the way of a path as described in the pending rejected claims. Byren describes a side-pumped slab, but beyond that there does not appear to be any overlap of substance with the pending claims.

In the rejection, the Office Action on pages 2 and 3 referred to column 3, lines 55 to 60 of Byren. As best understood, this cited portion of Byren appears to be relied upon as allegedly showing a “gain region”; however, the absorbing regions (referred to subsequently as #16) are not to provide gain but rather for thermal control. For example, Byren makes clear the following:

These absorbing layers . . . not optically radiative. Thus these absorbing layers bonded to edges of the active lasing medium do not lase. Rather, they release the absorbed energy in the form of heat.  
[Byren, col. 3, lines 57-63]

Further, the path referred to in the Office Action (the zig-zagging line in Fig. 1) is the pump path. Whereas claim 1 (and subsequent claims) relates to the path of the optical radiation to be amplified.

The Office Action also appears to allege that the zig-zagging line of the pump radiation relates to at least two spatially different grazing incidences reflections. Firstly, as mentioned above, those zig-zag lines relate to the pump radiation (which is not amplified) rather than to the optical radiation which the device is intended to amplify. Secondly, the language

“grazing incidence” is employed in the Office Action in a manner that is believed to be opposite its usual meaning.

As to the latter, it is respectfully submitted that one of ordinary skilled in the art of optics would understand that “grazing incidence” is a well-known term for incidence angle of a light ray at a very large angle from the normal to the surface and rather at a shallow angle with respect to the surface itself (hence the term grazing incidence). By way of example, this should be obvious to a skilled person by looking at the diagrams in the present patent application where the grazing angles are clearly small angles with respect to the pump face (rather than normal to the pump face). Indeed, the figures in the present application (and accompanying text) specifically illustrate the exemplary angles ( $q_1, q_2$ ) with respect to the pump face. See e.g., Claims 2 and 3.

In view of the foregoing, claims 1 and 12 and their dependent claims are believed to be distinguishable over the cited references.

Furthermore, the dependent claims are also believed to be further distinguishable over the cited references, as discussed below.

Claims 2 and 3 further define the grazing incidence angles. As noted above, the language “grazing incidence” is employed in the Office Action in a manner that is opposite its usual meaning and thus these claims are believed to be further distinguishable over the cited references. Accordingly, Claims 2 and 3 are believed to be further distinguishable over the cited references.

Regarding Claims 4, 5 and 6, the Office Action references again #16 in Fig. 3 of Byren. As discussed above, these regions (#16) are not gain regions at all but provide absorption of the pump radiation to release heat into the medium. These regions are not optically active and

do not lase, i.e., they are not gain regions. Accordingly, Claims 4, 5 and 6 are believed to be further distinguishable over the cited references.

Regarding Claim 7, the Office Action references pump cladding (#7) of Byren. This element provides reflection of the pump radiation. It does not provide feedback for the device to lase. Thus, claim 7, which concerns the amplification path, is believed to be further distinguishable over the cited references.

Regarding Claim 11, the Office Action references col. 6, lines 1-2 of Byren as allegedly disclosing uniform pump distribution. Claim 11, however, does not specify that there need be uniform pump distribution through the depth or the length of the active medium. Indeed, the specific embodiment for example describes pumping from a single face so there will be non uniform distribution in the depth of the medium. With respect to Claim 11, there is benefit if the gain extraction on each multiple bounce is similar – and not that the gain distribution is uniform. Thus, claim 11 is believed to be further distinguishable over the cited references.

**CONCLUSION**

Based on the foregoing amendments and remarks, the Applicants respectfully request reconsideration and withdrawal of the rejection of claims and allowance of this application.

**AUTHORIZATION**

The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment and Request for Reconsideration to Deposit Account No. 13-4500, Order No. 4586-4005.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. 13-4500, Order No. 4586-4005.

Respectfully submitted,  
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